Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1-29. (Canceled)

30. (Previously Presented) An optical system including an illumination optical system which illuminates a surface to be illuminated, the optical system comprising:

a birefringent element, disposed in an optical path of the optical system, that achieves a substantially circumferential distribution or a substantially radial distribution as a fast axis distribution in a lens aperture, the birefringent element is located at or near a position optically conjugate with the surface to be illuminated, in an optical path of the illumination optical system; and

an optical rotator disposed on an image side of the birefringent element and adapted to rotate a polarization state in the lens aperture.

31. (Previously Presented) The optical system according to Claim 30,

wherein the birefringent element includes an optically transparent member which is made of a uniaxial crystal material and a crystallographic axis of which is arranged substantially in parallel with an optical axis of the optical system, and

wherein a beam bundle of substantially spherical waves in a substantially circular polarization state is incident to the optically transparent member.

32. (Previously Presented) The optical system according to Claim 30,

wherein the birefringent element includes at least a pair of optically transparent members made of a crystal material of the cubic system,

wherein the pair of optically transparent members are so positioned as to achieve the substantially circumferential distribution or the substantially radial distribution as the fast axis distribution in the lens aperture, and

wherein a beam bundle of substantially spherical waves in a substantially circular polarization state is incident to the pair of optically transparent members.

33. (Previously Presented) The optical system according to Claim 32,

wherein the pair of optically transparent members are arranged in a state in which a crystal orientation <111> is substantially parallel with an optical axis of the optical system and in which the other crystal orientations are relatively rotated by about 60° around the optical axis.

34. (Previously Presented) The optical system according to Claim 32,

wherein the pair of optically transparent members are arranged in a state in which a crystal orientation <100> is substantially parallel with an optical axis of the optical system and in which the other crystal orientations are relatively rotated by about 45° around the optical axis.

35. (Canceled)

36. (Previously Presented) The optical system according to Claim 30,

wherein the optical rotator is located at a position where a beam bundle is incident thereto with variation of not more than 10° in an angle of incidence.

37. (Previously Presented) The optical system according to Claim 30,

wherein the optical rotator rotates the polarization state in the lens aperture by about 45°.

38. (Previously Presented) The optical system according to Claim 30,

said optical system including a projection optical system which forms an image of a first plane on a second plane.

39. (Canceled)

40. (Previously Presented) The optical system according to Claim 30,

said optical system including the illumination optical system which illuminates the surface to be illuminated, in a substantially telecentric manner.

41. (Canceled)

42. (Previously Presented) The optical system according to Claim 40,

wherein the illumination optical system forms a secondary light source including a predetermined optical intensity distribution, on an illumination pupil plane, and

wherein the predetermined optical intensity distribution of the secondary light source is so set that an optical intensity in a pupil center region being a region on the illumination pupil and including an optical axis is smaller than an optical intensity in a region around the pupil center region.

43. (Previously Presented) The optical system according to Claim 42,

wherein the predetermined optical intensity distribution of the secondary light source includes an optical intensity distribution of an annular shape or multi-pole shape.

44. (Previously Presented) The optical system according to Claim 30,

said optical system including the illumination optical system which illuminates a first plane in a substantially telecentric manner; and a projection optical system which forms an image of the first plane on a second plane.

45. (Previously Presented) The optical system according to Claim 44,

wherein the birefringent element is located in an optical path of the illumination optical system, and

wherein the optical rotator is located in an optical path of the projection optical system.

46. (Previously Presented) The optical system according to Claim 45,

wherein the birefringent element is located near the first plane, or at or near a position optically conjugate with the first plane, in the optical path of the illumination optical system.

47. (Previously Presented) The optical system according to Claim 46,

wherein the illumination optical system forms a secondary light source including a predetermined optical intensity distribution, on an illumination pupil plane, and

wherein the predetermined optical intensity distribution of the secondary light source is so set that an optical intensity in a pupil center region being a region on the illumination pupil and including an optical axis is smaller than an optical intensity in a region around the pupil center region.

48. (Previously Presented) The optical system according to Claim 47,

wherein the predetermined optical intensity distribution of the secondary light source includes an optical intensity distribution of an annular shape or multi-pole shape.

49. (Previously Presented) The optical system according to Claim 30,

said optical system being an optical system for lithography.

50-93. (Canceled)

94. (Previously Presented) An exposure apparatus comprising:

an optical system which effects exposure of a predetermined pattern on a photosensitive substrate and which includes an illumination optical system which illuminates the predetermined pattern,

wherein said optical system comprises:

a birefringent element which achieves a substantially circumferential distribution or a substantially radial distribution as a fast axis distribution in a lens aperture, and which is located at or near a position optically conjugate with the surface to be illuminated, in an optical path of the illumination optical system; and

an optical rotator located on an image side of the birefringent element and adapted to rotate a polarization state in the lens aperture.

95. (Previously Presented) The exposure apparatus according to Claim 94, wherein the optical system includes the illumination optical system which illuminates the predetermined pattern in a substantially telecentric manner.

96. (Canceled)

97. (Previously Presented) The exposure apparatus according to Claim 95, wherein the illumination optical system forms a secondary light source including a predetermined optical intensity distribution, on an illumination pupil surface, and wherein the predetermined optical intensity distribution of the secondary light source is so set that an optical intensity in a pupil center region being a region on the illumination pupil and including the optical axis is smaller than an optical intensity in a region around the pupil center region.

98. (Previously Presented) The exposure apparatus according to Claim 97, wherein the predetermined optical intensity distribution of the secondary light source includes an optical intensity distribution of an annular shape or multi-pole shape.

99. (Previously Presented) The exposure apparatus according to Claim 94, wherein the optical system includes:

the illumination optical system which illuminates the predetermined pattern surface in a substantially telecentric manner; and

a projection optical system which forms an image of the predetermined pattern surface on a surface of a photosensitive substrate.

100. (Previously Presented) The exposure apparatus according to Claim 99, wherein the birefringent element is located in an optical path of the illumination optical system, and

wherein the optical rotator is located in an optical path of the projection optical system.

101. (Previously Presented) The exposure apparatus according to Claim 100,

wherein the birefringent element is located near a first plane, or at or near a position optically conjugate with the first plane, in the optical path of the illumination optical system.

102. (Previously Presented) The exposure apparatus according to Claim 99,

wherein the projection optical system forms the image of the predetermined pattern surface on the surface of the photosensitive substrate through a liquid.

103-119. (Canceled)

120. (Previously Presented) A device fabrication method comprising:

preparing a photosensitive substrate;

exposing a predetermined pattern to be transferred, on the photosensitive substrate through an optical system including an illumination optical system, said optical system comprises a birefringent element and an optical rotator,

wherein the exposing comprises:

achieving a substantially circumferential distribution or a substantially radial distribution as a fast axis distribution in a lens aperture by the birefringent element; and

rotating a polarization state in the lens aperture being a polarization state of a beam bundle including having passed through the birefringent element, by the optical rotator; and

illuminating the predetermined pattern through the optical system,

wherein the birefringent element is located at or near a position optically conjugate with the predetermined pattern surface, on an optical path of the illumination optical system.

121. (Previously Presented) The device fabrication method according to Claim 120,

wherein the optical system includes the illumination optical system, and

wherein the exposing includes illuminating the predetermined pattern in a substantially telecentric manner through the optical system.

122. (Canceled)

123. (Previously Presented) The device fabrication method according to Claim 121,

wherein the illuminating comprises forming a secondary light source including a predetermined optical intensity distribution, on an illumination pupil plane, and

wherein the predetermined optical intensity distribution of the secondary light source is so set that an optical intensity in a pupil center region being a region on the illumination pupil and including an optical axis is smaller than an optical intensity in a region around the pupil center region.

124. (Previously Presented) The device fabrication method according to Claim 123,

wherein the predetermined optical intensity distribution of the secondary light source includes an optical intensity distribution of an annular shape or multi-pole shape.

125. (Previously Presented) The device fabrication method according to Claim 120,

wherein the optical system includes the illumination optical system and a projection optical system, and

wherein the exposing includes illuminating the predetermined pattern surface in a substantially telecentric manner by the illumination optical system, and forming an image

of the predetermined pattern surface on a surface of the photosensitive substrate by the projection optical system.

126. (Previously Presented) The device fabrication method according to Claim 125,

wherein the birefringent element is located in an optical path of the illumination optical system, and

wherein the optical rotator is located in an optical path of the projection optical system.

127. (Canceled)

128. (Previously Presented) The device fabrication method according to Claim 120,

wherein the optical system includes a projection optical system, and

wherein the exposing includes forming an image of the predetermined pattern on a surface of the photosensitive substrate through a liquid.